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How to capture opportunities for creativity and pull in fresh new ideas.

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HeadsUp

"We're at 1% of what's possible," Google CEO Larry Page said at his company's I/O developers conference.

REUTERS/EDUARDO MUNOZ

IT INNOVATION

Page Pans Negativity, Extols Crazy Ideas

INNOVATION, NEGATIVITY, CRAZY IDEAS and nothing less than the future of technology were on Google CEO Larry Page's mind when he took the stage at his company's I/O developers conference in San Francisco recently.

With no demos and no fancy images projected on the giant screens behind him, Page stood alone on stage and talked directly to his audience.

"I'm tremendously excited about all the innovation you're bringing to life," he said, but added that he's saddened by negativity in the industry that he contends has slowed the progress of innovation.

"We should be building great things that don't exist," he said. "No matter how fast the change in the industry, we're still moving slow compared to the opportunities we have."

"And part of that is the negativity that I read about Google and others," Page argued. "Being negative is not how we make progress."

What does lead to progress — at least at Google? Crazy ideas.

"Almost every time we've done something crazy, we've made progress," he said. "I say we're at 1% of what's possible."

One of those crazy ideas was Google Glass.

"Our main goal is to get happy users using Glass," he said. "And then we can get going and work on it for the next 10 years."

Page said what excites him most, personally, about the Glass technology is using it to take pictures of his children. "I have young kids," he explained. "For me, that's enough."

– Sharon Gaudin

TELECOMMUTING

Thanks to IT, More People Can Work From Home

Unless you work at Yahoo, where CEO Marissa Mayer has banned telecommuting, there's a good chance you work from home or at a coffee shop once in a while.

That's according to Forrester Research, which found some big changes in the way we work when it recently surveyed 9,766 people about how they do their jobs.

Forrester analyst David Johnson said more companies are embracing the idea of allowing employees to pursue flexible working arrangements – whether that means working from home all day or ducking out of the office to spend a few hours at a Wi-Fi-enabled eatery.

In 2010, 18% of employees polled said that they worked from home at least one day a week. That's now up to 26%, according to Forrester's latest data.

More people are also spending some of their working hours in public places, such as coffee shops. In 2010, about 6% of the respondents to Forrester's survey said that they occasionally worked in public places. Now it's 12%. And Johnson said traveling employees work from public sites more often than not.

Johnson credits IT improvements for this trend. Citing innovations such as faster networks and cloud-based collaboration tools, he said, "all these things make it easier for people to work outside the office."

– PATRICK THIBODEAU

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Microsoft

CLOUD CONSISTENCY VS. CLOUD CONFUSION

BETWEEN THE LINES
By John Klossner

WE'RE AT 1% OF WHAT'S POSSIBLE.
THERE GOES ALL MY DATA.
WHAT DATA of MINE DON'T THEY HAVE?
THEY CAN GET MORE?
THERE GOES ALL MY DATA.

IT INDUSTRY

Dell Again Scapegoats Windows 8

DELL HAS ONCE AGAIN thrown Windows 8 under the bus, saying the unpopular operating system contributed to a decline in its PC-related revenue during the quarter that ended May 3.

"Windows 8 has been . . . not necessarily the catalyst to drive accelerated growth that we had hoped it would be," said Dell CFO Brian Gladden in a recent conference call with Wall Street analysts to discuss the company's quarterly financial performance.

It was the second time that Dell has tried to explain away lackluster sales figures by pointing a finger at Windows 8.

In March, Dell said the operating system was to blame for its financial woes in documents filed with the U.S. Securities and Exchange Commission as part of CEO Michael Dell's effort to take the company private.

In its latest quarterly report, Dell said revenue from sales of PCs, third-party software and peripherals — what the company collectively calls end-user computing — was down 9% from the same period a year earlier. Desktop revenue was off 2%, and revenue from what Dell dubs "mobility," or notebooks and tablets, was down 16%.

But with a Windows 8 update expected to launch in October Gladden said he has hope that sales will improve later in the year.

And given the fact that, by Microsoft's estimate, one-third of enterprise computers still run Windows XP, Gladden also cited upgrades to Windows 7 as a ray of hope. "It's driving a refresh cycle," he said.

But Brian Marshall, an analyst at ISI Group, said in a note to clients that PC shipments could decline as much as 10% to 20% over the next three to five years before stabilizing.

Nonetheless, Dell has previously said that it won't abandon Windows 8 or Microsoft's tablet-oriented offshoot, Windows RT, and Gladden reiterated that support, saying, "It's really up to us to create that opportunity and that ecosystem to drive that growth going forward."

– Gregg Keizer

Micro Burst

Apple agreed to pay

$53 million

to settle a lawsuit related to iPad and iPod warranties.

INTERNET COMMERCE

Bitcoin Group Seeks to Double Staff – to Four

Technically savvy people may be the coin of the realm at the Bitcoin Foundation these days.

The foundation, which handles most of the back-end development work for the digital currency, currently has just two full-time staff members and is seeking a full-time lead quality assurance professional and a project manager.

Chief scientist Gavin Andresen said code review and testing has proven to be a bottleneck in the development process as the foundation eyes the addition of new services such as enhanced security features for mobile wallets.

A more robust back end could provide other benefits, such as the ability to thwart cyberattacks on Bitcoin systems. Mt. Gox, the largest Bitcoin exchange, was hit with a denial-of-service attack in April.

Many online retailers and brick-and-mortar stores accept Bitcoins, and it's estimated that Bitcoins have been used in 18 million transactions in the four years since the currency was introduced. Some estimates peg the total number of users in the millions, but it's difficult to determine an exact number because the currency is unregulated and is obtained through various online exchanges.

- ZACH MINERS, IDG NEWS SERVICE

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Sen. Charles Grassley says the immigration bill "does nothing to stop huge increases in H-1B visas."

Senate Set to Sniff 'Stinky Onion' Bill

Grassley attacks last-minute H-1B provisions added to Senate immigration bill at the behest of the tech industry. Patrick Thibodeau

WITH HIS H-1B FIGHT over and lost to the tech industry, Sen. Charles Grassley (R-Iowa) lashed out in the minutes before the Senate Judiciary Committee's final vote on the controversial immigration bill late last month.

It was late in the day and the committee was moments away from a 16-2 vote to approve 19 pages of industry-sponsored H-1B amendments to the long-awaited bill.

At that point, H-1B critic Grassley found no need for niceties. "Let's peel back the onion and see how much this stinks," he said, and proceeded to attack the legislation across the board. Criticism is likely to grow in the months ahead as the updated H-1B provisions are further analyzed.

Full Senate debate on the bill is slated to begin this month, when more attempts to amend it are expected.

[illegible] stinks."

The original bill, drafted by a bipartisan Senate group known as the Gang of Eight, would have raised the base cap on H-1B visas from 65,000 to 110,000, with an escalator that could increase the cap to 180,000 in increments of 10,000 in response to demand. The tech industry sought a cap of at least 300,000.

The revised bill raises the initial cap to 115,000, a small, seemingly spiteful incremental increase.

The annual escalator was increased to 20,000, while the overall cap stays at 180,000. The amended bill blocks escalator increases if unemployment for pertinent jobs is 4.5% or higher.

"Did the supporters of the amendment know that the average unemployment [rate] for this group was 3.7% last April?" said Grassley. "This does nothing to stop huge increases in H-1B visas."

The late amendments would also require that H-1B hiring companies post jobs on a government-sponsored website. However, only so-called "dependent firms" — those where 15% or more of the employees are on visas — must offer jobs to equally or better qualified U.S. workers.

That amendment "cancels out the only possibly real and tangible protection that U.S. workers would have gotten," said Daniel Costa, an analyst at the Economic Policy Institute.

Costa contends that the new formula will cause the H-1B cap to rise much faster than the initial plan.

Ron Hira, a public policy professor at the Rochester Institute of Technology who researches H-1B issues, called the final bill "a huge step backward for American workers."

IEEE-USA President Marc Apter was also critical. "This will allow large multinational technology companies to replace American workers with lower-cost H-1B employees," Apter said in a statement. "It would be nice if Congress would look out for its citizens rather than the profit-driven interests of employers."

The industry amendments were sought by Sen. Orrin Hatch (R-Utah) and were included in the final bill as a result of a compromise with Sen. Chuck Schumer (D-N.Y.), a member of the Gang of Eight.

Schumer contended that the revised wage requirements would prevent employers from using H-1B visa holders as cheap labor, and would allow unhappy visa holders to more easily leave a company.

Republican lawmakers in the House, meanwhile, have released a plan of their own. The so-called Skills Visa Act would raise the base H-1B cap to 155,000 and increase the number of visas set aside for foreigners who earned advanced degrees at U.S. universities from 20,000 to 40,000. ◆

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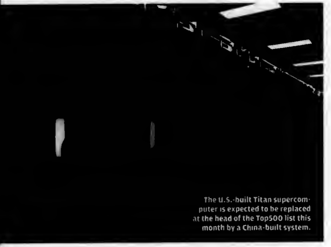

The U.S.-built Titan supercomputer is expected to be replaced at the head of the Top500 list this month by a China-built system.

'Sputnik Moment' Looms as R&D Ebbs

Top U.S. researchers warn Congress that America's lead in supercomputer development is in danger due to R&D budget cuts. By Patrick Thibodeau

IN OCTOBER 2010, China built what was then the world's fastest supercomputer. Three months later, President Barack Obama warned in his State of the Union address that America was facing a "Sputnik moment."

Pointing to rapid technological advances in other countries, China in particular, Obama called for more federal investment in research into biomedical engineering, clean energy and information technology.

That call went unheeded, and two years later that Sputnik moment still looms. Federal spending on R&D is at its lowest level in 40 years, thanks to the ongoing budget dispute between Congress and the White House that led to sequestration, says the American Association for the Advancement of Science. The cuts threaten to hurt a slew of projects, including U.S. development of an exascale computer that would be roughly 1,000 times more powerful than today's systems.

While Congress was preoccupied with hearings on the IRS scandal late last month, top U.S. supercomputing researchers told a House energy subcommittee that China, Japan and Europe are investing heavily in supercomputer development, and may beat the U.S. in the race to exascale systems.

At current levels of investment, the U.S. likely won't have exascale technology until "the middle of the next decade," said Rick Stevens, associate laboratory director at Argonne National Lab.

Meanwhile, Japan is spending $1.1 billion to develop exascale machines by 2020, "and China has announced a goal to reach exascale before 2020," Stevens said.

Stevens told lawmakers that the U.S. must boost current HPC research funding by $400 million a year to at least stay on par with China. "At that funding level, we think it's feasible — not guaranteed, but feasible — to deploy [an exascale system] by 2020," he said.

Stevens said the U.S. has the expertise to develop exascale technologies. "We just need the resources and the commitment," he said.

Experts expect that China will regain first place in the biannual listing of the 500 most powerful supercomputers this year. The Chinese system will likely be based on U.S. components, but Stevens noted that China is developing its own chips and other components for future high-end systems.

China is expected to unveil that supercomputer in time for the release of the next Top500 list in mid June. An 18-petaflop Cray system running at the Oak Ridge National Laboratory tops the current list.

Overall, the U.S. today maintains a clear lead in supercomputing, both in terms of number of systems and the tech skills of its technology vendors.

But building 1,000-petaflop exascale systems poses big challenges, particularly when it comes to the amount of electricity they would use. A system of that size today would require about 1 gigawatt of power, or the total output an average power plant.

To keep power requirements in check, an exascale system would need processors, memory and network components that use considerably less electricity than today's systems. It would also require programming models that would let applications scale across millions of cores. Resiliency, the ability to operate without interruption as components fail, is another a key research issue.

"It's very important that the United States maintain the key intellectual property [for supercomputers]," said Dona Crawford, associate director for computation at Lawrence Livermore National Laboratory in Livermore, Calif. "I would not want to cede that to another country."

The White House did not include an exascale-specific spending request in its recently released 2014 budget. ◆

"It's very important that the United States maintain the key intellectual property [for supercomputers]

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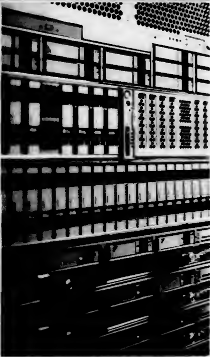

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THE Grill

Paul Lucidi

This healthcare CIO stresses the importance of employee appraisals.

What's your favorite tech toy? We're evaluating Microsoft Surface Pro, so some if it is learning the device and some of it is learning Windows 8. It's different, but I'm getting the hang of it.

What's your next career step? I'd like to continue to expand operational opportunities beyond IT into something like a chief operating officer role.

What do you do in your spare time? I like doing anything outside: I ski, I golf, I like fishing.

Is there something that not many people know about you? I once wrote an article for *Ducks Unlimited* magazine. They bought it, but I don't know if they published it. This was when everything was done by mail.

PAUL LUCIDI'S *25-person IT team supports approximately 600 workers at Insulet Corp., a Bedford, Mass.-based medical device company. As CIO, he says he strives to ensure that his IT workers are at the top of their game, and to do that, he focuses on assessing and developing his employees. "You have to build an organization that helps your business succeed, so you want people who are fully engaged, and to be fully engaged, they need to come to work and feel successful," he explains. Here he shares more thoughts on his priorities and strategies as well as what he brings to the task.*

What is the biggest IT initiative you're working on right now? "Conventus," which means "coming together" in Latin. We had acquired a company almost two years ago, and at the time we made the acquisition we did some limited integration. But now what we're focused on is harmonizing business processes and bringing both together on common technology platforms. We have some significant deliverables.

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> There are four things I use [to assess my performance]: **strategy, execution, personal leadership and my ability to influence other people.**

How did you prepare your organization to handle this? I have a small but talented team, and we do a really good job at resource planning. So we evaluated where we had competencies in-house and where we needed outside resources. For areas where we need help, we looked at the landscape and did an RFP and ultimately settled on one [firm to hire for help]. And we made a couple of key hires at the end of last year anticipating we would be starting this project.

What skills do you look for in employees? It depends on the job that we're hiring somebody to do. We look for depth and experience with our core platforms. But beyond that, beyond specific technologies and experience, we look for business process skills, knowledge of governance concepts. We always look for communication skills and industry-type things, [such as] whether you understand HIPAA and information security because they're relevant to healthcare.

How do you assess individual employees to ensure they're performing at their best? I look at it from two sides. There's the individual's contribution to the role and the organization's contribution to the individual. On the individual side, it's how well are they performing on the job, and on the other side, how well have we defined the role, do we give employees what they need to be successful? It's the environment in which we operate and how well do they do in it.

How do you work to improve the performances of employees who could be doing better? There are really five components to it. The first is communication and honesty. It's really being clear with the individual about what's expected of them in their position and having an honest conversation about their performance. And it's having that conversation as it's happening and not waiting for an annual review. Then the third piece involves listening. If someone is struggling, maybe it's because they don't have what they need to be successful in their role or they're just not right for the role. So after the communication and the honest feedback and the listening piece, then comes whatever the set of corrective actions are. Sometimes you have to decide to move on.

How do you assess your own performance as a CIO? It's hard to separate how you're doing and how your organization is doing. I can't be successful if my organization isn't successful. But there are four things I use [to assess my performance]: strategy, execution, personal leadership and my ability to influence other people. Some of those have clear measures, like on the execution side, but others are subjective, like the ability to influence, and it could be mixed. You might be able to influence some peers but not others.

Are these ways you judge yourself or how others judge you? They're really both. If I looked at my goals for the year and the way I structure them, they fall into those categories. These are key attributes you can apply to a number of executive roles.

You have a dual role: leading IT and leading Insulet's global program office. How do you balance the two jobs? I assumed responsibility for the program office in early in 2011, and what the program office does is run a lot of the business programs for new products and technologies. So I have a team of [program managers] there — all engineers, all talented — and they focus on new products and technologies. There are a lot of similarities with running this and IT. You manage scope and resource planning and project plans, but the nature of the work and the deliverables are different.

For me, it was a natural fit. But it's not so much a line between the two jobs, it's just for whichever projects you need to focus on due to priorities or they need attention in some ways, you switch your focus.

— *Interview by* Computerworld *contributing writer* **Mary K. Pratt** *(marykpratt@verizon.net)*

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PRESTON GRALLA

Microsoft's Mobile Corpse Stirs With Signs of Life

MICROSOFT'S MOBILE COMPUTING INITIATIVES have been written off as DOA for years. But something has been happening while you weren't looking: Microsoft is beginning to show flickering signs of life in the mobile sphere.

Microsoft is nothing if not persistent when there are markets to be conquered.

Up to now, Microsoft's failures to get a foothold in mobile computing have been spectacular. It had a smartphone operating system and a tablet years before Apple, but it could never capitalize on that head start. Internal turf wars, technology false starts and a lack of understanding about how people really want to use mobile devices all played a role in Microsoft's mobile demise. The company's low point may have been the 2010 release of the Kin, a phone that required a data contract but couldn't run apps. After less than two months on the market, Microsoft mercifully pulled the plug. It was an expensive and embarrassing venture; Microsoft had paid an estimated $500 million or more to buy the company that made the Kin, and it took a $240 million write-off for killing it.

Of course, Microsoft is nothing if not persistent when there are markets to be conquered. It's still taking a whack at mobile, with Windows Phone and the Windows 8 and RT tablets. Still without much traction, though. The obituaries have been written, if not published. But it may be too soon to call for the last rites: People are starting to buy Windows 8 tablets and Windows phones.

Microsoft's mobile numbers aren't at the level it's accustomed to in areas like desktop operating systems and productivity suites. Windows tablets are at 7.5% market share, according to Strategy Analytics. IDC says Windows Phone 8 devices were at 3.2% in the first quarter. Those figures aren't likely to worry Apple and Google too much — yet. But they're on the rise. The Microsoft mobile corpse has been reanimated.

Let's put those numbers in perspective. Microsoft's tablet share is dwarfed by Apple's 48.2% and Android's 43.4%. But a year ago, the Windows numbers were so insignificant that Strategy Analytics wasn't even tracking them.

As for Windows Phone, that minuscule 3.2% is enough to make it the third most popular smartphone operating system, surpassing BlackBerry's 2.9%. Of course, Android, at 75%, enjoys the kind of market share that Microsoft is used to commanding. But momentum matters, and that's something Apple is in a position to appreciate. Its iOS has a 17.3% market share. A year ago, it had 23%, against Windows Phone's 2%. So in 12 months, the gap between iOS and Windows Phone shrank from 21 percentage points to 14.1.

Can Microsoft capitalize on its momentum? I wouldn't bet against it. It is poised to roll out budget smartphones, which will help with its strongest smartphone demographic, first-time buyers. Mary-Ann Parlato, an analyst at Kantar Worldpanel ComTech, wrote in a recent report that "with over half of the US market still owning a featurephone, it's likely that many will upgrade over the coming year, which will ultimately contribute to more growth for the Windows brand." And Microsoft has published design specs for 7-in. Windows 8 tablets, which would help it compete in the fast-growing market for small tablets.

So while it's true that Microsoft still lags well behind its competitors in mobile, it finally has a foothold in the market. And while the company has a tendency to blow early, first-to-market advantages, it's much more successful when it has a second chance. ◆

Preston Gralla is a *Computerworld.com* contributing editor and the author of more than 35 books, including *How the Internet Works* (Que, 2006).

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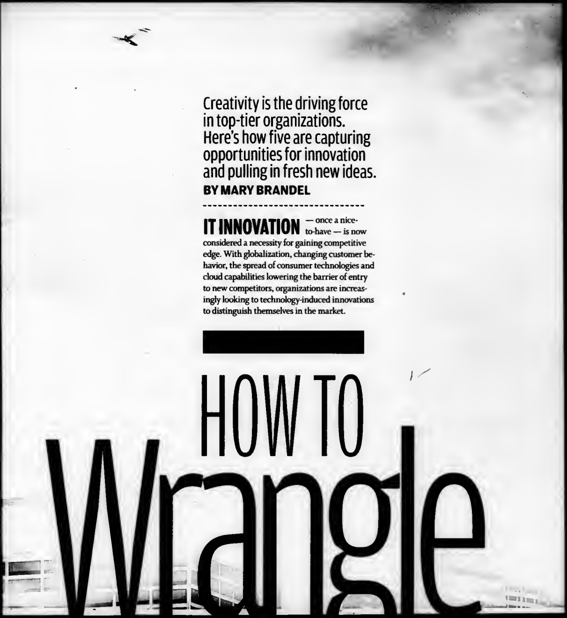

HOW TO Wrangle INNOVATION

Creativity is the driving force in top-tier organizations. Here's how five are capturing opportunities for innovation and pulling in fresh new ideas.

BY MARY BRANDEL

IT INNOVATION — once a nice-to-have — is now considered a necessity for gaining competitive edge. With globalization, changing customer behavior, the spread of consumer technologies and cloud capabilities lowering the barrier of entry to new competitors, organizations are increasingly looking to technology-induced innovations to distinguish themselves in the market.

The Innovators

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– Brian Lillie, CIO

CAPITALONE

- **"We're focused not just on cool technology** but on innovative products and services to delight the customer."
– Monique Shivanandan, chief technology officer

AMERICAN CANCER SOCIETY

- **"We're not Google or Facebook,** but that doesn't give us license to be stagnant." *– Jay Ferro, CIO*

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- **"Supporting breakthrough innovation efforts** is at the heart of differentiating MasterCard from our competitors, and key to sustaining our competitive advantage in the marketplace." *– Garry Lyons, chief innovation officer*

GRANGE INSURANCE

- **"With the right business acumen, and the right understanding of technology trends,** IT can deliver solutions that the business could not have fathomed."
– Michael Fergang, CIO

But we're not talking about one-off great ideas, says Chip Gliedman, an analyst at Forrester Research. "Companies need to instill processes, governance and incentives to support a continuously sustained innovation program," he says. Otherwise, it's all too easy to revert to day-to-day operational concerns and avoid the risk of failure that is a faithful companion to creative pursuits.

There is no one-size-fits-all approach to jump-starting an innovation program. Some organizations, like CapitalOne and MasterCard, create "digital labs" to foster new ideas and bring them to fruition. Others, such as the American Cancer Society, form steering committees to guide smaller core groups. Still others, like Grange Insurance, take a skunk works approach, while organizations like Equinix choose a decentralized model of innovation.

We spoke with those five organizations to find out how they are building their futures on innovation.

Where do you position the innovation group, organizationally?

- **Equinix:** Innovation at this global data center provider happens in pockets around the company, with support from top leadership. "Instead of centralizing innovation or having a badged team, we have smart engineers, applying a concentrated effort to real business opportunities," says CIO Brian Lillie. Small teams periodically submit ideas and, when approved, are given resources to pursue innovations. A challenge of this approach is freeing people from day-to-day work. "We have to be clear in our minds that we're putting our best engineers on our best opportunities, not our biggest problems, and we don't hammer them when they drop the ball on something else while they're innovating," Lillie says.
- **American Cancer Society:** At the nonprofit health organization, a cross-functional steering committee sets the rules of engagement for innovation and provides executive-level "air cover," as well as support, motivation and engagement, says CIO Jay Ferro. Meanwhile, a core innovation team works at an operational level. All employees are invited to submit ideas through an innovation management platform, and the core team manages the entire process, from submission through approval. "With 12 divisions and hundreds of locations around the world, it was important to approach the ideation process in a unified way rather than having different sets of ideas aimed at different goals," Ferro says.
- **CapitalOne:** The financial services company set up three innovation labs in New York, the Washington, D.C., area and San Francisco, all intentionally placed in the middle of technologically innovative cultures, according to CTO Monique Shivanandan. "We combine technology people, data analysts, marketing people, brand managers and product managers in the labs to be sure we're focused not just on cool technology but innovative products and services to delight the customer," Shivanandan says. She points out that the emphasis of the innovation lab approach is more about establishing an innovation "ecosystem" than it is about setting up a physical facility.

"You could get a conference room, put a paper sign up and designate it as 'the lab,' and you'll have a structure in place," she says. "Even with just a handful of people, you can foster a culture of creativity, as long as they're not operating in a vacuum but with the right folks across and outside of the business, to drive results that are valuable to the business and its customers."

- **MasterCard:** The payment industry giant formed MasterCard Labs in 2010 as a global R&D arm focused on developing innovative payment solutions. Labs are located in New York, St. Louis, Dublin and Singapore. Additionally, MasterCard Labs works closely with business owners to spread the innovative spirit across the company, says Garry Lyons, chief innovation officer.
- **Grange Insurance:** A core group of business and technology professionals meets monthly at the $1.3 billion insurer to brainstorm opportunities to move the business forward with new technology and then uses agile practices to explore the feasibility of ideas and bring them to fruition.

The group is purely focused on driving profitable growth, says Michael Fergang, CIO: "Every group has goals for continuous improvement, but we focus on new technologies that will help Grange differentiate itself in the marketplace." Because of their business acumen, Grange's technologists are in a prime position to link new technology trends with new opportunities, according to Fergang. "The business can't envision what can be done, because by themselves, they can't imagine the applicable technologies," he says.

Because of this skunk-works-type approach, passion is a requirement, Fergang says. "We will never have the capacity to support the demand," he says. "It takes the ingenuity of the individuals and their managers to reshuffle their work. We're not Google, where people get every fifth day to innovate."

How is the innovation group staffed?

- **Equinix:** Rather than appointing someone as "the innovation guy," Lillie says, "we try to hire creative, idea-generating people." For instance, job candidates are asked during the interview process how they would solve particular business problems.
- **American Cancer Society:** The organization's innovation steering committee includes senior leaders from marketing, operations, mission delivery and corporate communications.

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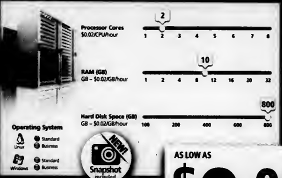

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"I'm the only IT representative, and that was key to showing this wasn't just IT doing new things but a commitment to impacting the organization," Ferro says. Meanwhile, the core innovation team includes just three people, with an additional dozen or so employees from diverse functions and geographic areas rotating in and out of the group, each serving about a year.

"These are folks who live with functions like fundraising and the advocacy mission every day," Ferro says. "That diversity is one of the secret sauces to innovation." Workers from the rank and file, he says, tend to offer more radical ideas, while executives can be more risk-averse. The trick is capturing the best of both worlds, Ferro says. That means securing unquestioned support for innovation from the CEO on down. "That is a core tenet of innovation at ACS," he says.

- **CapitalOne:** When staffing its labs, CapitalOne combined "the best of the best" from its internal teams and then hired people with business or technology backgrounds and expertise in areas such as startups, rapid prototyping, agile processes and technologies like mobile, big data and the cloud, Shivanandan says. CapitalOne has also acquired several startups to seed its labs with specialized technology or business skills, such as mobile coupons or data analytics.

Lab staffs are kept small, Shivanandan says, with 20 to 45 team members in each lab, including technology and business experts. Additionally, people from business units typically get involved in projects aimed at their particular area. "We are one of the best data companies in the world, so we have a lot of people who understand how to use data," Shivanandan says.

Because of the lean staffing model, the labs find that their services are always in demand, but they're also able to respond quickly. "They're viewed as a necessity, not a nice-to-have," Shivanandan says. "When people get something out of the lab, it's seen as a privilege and a great opportunity."

Even with just a handful of people, you can foster a culture of creativity, as long as they're not operating in a vacuum.

MONIQUE SHIVANANDAN,
CTO, CAPITALONE

- **MasterCard:** Lyons says he looks for smart, creative people "who have an appreciation of how technology can make people's lives easier." They don't necessarily need to have a background in the payments business; in fact, Lyons prefers candidates with different backgrounds and perspectives. "I have access to a lot of phenomenal payments knowledge at MasterCard, so I want to hire people with other skill sets," he says. "I believe that if you know too much about a domain, you either start with the premise that something isn't possible or you can only incrementally improve what already exists."

- **Grange Insurance:** Grange's innovation group includes programmers and business people at all levels, Fergang says. "It includes myself as CIO, down to relatively junior programmers," he says. People rotate in and out of the group every couple of years — an approach that helps up-and-comers get to know higher-level managers.

How do you establish processes and expectations for delivering ideas and bringing them to fruition?

- **American Cancer Society:** After reviewing best-of-breed innovation processes, the innovation steering committee established specific processes for the core innovation team to follow, from encouraging idea submissions, to vetting ideas, to deciding which to pursue. Once an idea moves forward, it moves into the standard project management life cycle.

The innovation management platform ensures that these processes are followed without a lot of direct oversight, Ferro says. One of the basic tenets is focusing the ideation process on specific business issues. Workers from around the world can comment and vote on one another's ideas. The core innovation team reviews ideas that get a lot of thumbs up and also scores ideas itself, using criteria such as mission impact, cost savings, community outreach and risk mitigation. "This isn't a glorified suggestion box; it's about how to do things faster or deliver higher quality on a program," Ferro says.

The crowdsourcing approach yields fresh ideas with minimal resources, Ferro says. "You don't want to dedicate 100 people to innovation, but if you crowdsource ideas from people who might never have interacted before and then use a small core team to manage the process, a natural evolution takes hold," he says. "The speed of innovation is rapidly increasing."

- **CapitalOne:** Within the labs, staffers are split into small teams that follow agile processes, such as frequent iterations and fast prototyping. The environment itself — including whiteboard-covered walls — encourages creativity and brainstorming.

Each lab has a main focus for innovation, Shivanandan says: leveraging big data for better products and services in New York; mobile wallets, couponing and other digital services in Virginia; and opening the company's banking APIs to third parties to provide additional services in San Francisco.

The labs make monthly presentations to the steering committee on current projects and lessons learned. "The teams are agile and quick, so they get a lot done each month, and when something happens in the industry, we can quickly reprioritize," Shivanandan says. "We're really trying to create a tiger team to focus on the art of the possible."

Importantly, each lab's focus is well integrated with business goals. "It's not just this cool place where people do crazy things," Shivanandan says. "There's a prioritization process, and it's integrated with the work people are doing on an everyday basis."

- **MasterCard:** Each lab has three priorities: innovation management, technology and incubation. The teams work closely together to generate ideas, evaluate them and then define concepts, build prototypes and use a test-and-learn approach to see how those ideas will fare in the market.

The teams aren't judged based on hits and misses, but on their ability to apply lessons learned to what does eventually succeed, says Lyons. "We want to be honest with ourselves about whether or not ideas are viable," he says. "[That] involves failing fast and making the tough decision to stop work when it's appropriate."

Additionally, the company sponsors processes that spur innovation from its employees, Lyons says. For instance, more than half the company has participated in Aspire, an online, social collaborative brainstorming program, he says, and employees are

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also given time to work on ideas that they're passionate about. Meanwhile, Innovation Express is a 48-hour competition to build prototypes, video demos and go-to-market plans, and KickStart is a fast-paced, time-boxed, dedicated startup-like environment to accelerate commercialization of a product.

- **Grange Insurance:** During monthly meetings, the innovation group discusses opportunities, uses a heat map to rate ideas with the lowest risk, lowest cost and highest value and assigns skunk works groups to investigate applicable technologies and idea feasibility. Individual teams do some prototyping and provide updates at the next meeting. Once they have something to show, they share the prototype with business leaders. "When you have something that someone can visualize, you gain support more quickly," Fergang says. When approved, projects get funded and enter a formal project management process.

The key is speed: Prototype fast, and fail fast. "We don't choose 30 things to pursue," Fergang says. "We scale back to just a few and then do them as fast as possible." About twice a year, the group conducts a show-and-tell, inviting business leaders to see a range of prototyped ideas.

- **Equinix:** It's crucial to recognize that some ideas don't pan out. At Equinix, "no one is penalized" for failures, because failing is part of learning, Lillie says. In fact, one engineer learned so much about hybrid clouds through a stalled innovation initiative that he now helps educate customers on the topic. "Not everything is going to work out, but it's all great learning," Lillie says.

What are some tips for getting executive buy-in and funding?

- **CapitalOne:** Early in her tenure, Shivanandan organized a "scan trip," which involved taking a group of business and technology executives to visit with innovators and startups, including Google, Facebook and Square, to answer the question, "What is innovation in the banking industry?" "I wish I could say I did it intentionally to get everyone jazzed up, but that was the ultimate result," she says. "It was an 'aha moment' that really showed us there's a lot happening and that technology is a key enabler to banking in the future." Nine months later, the company secured a physical structure for its first digital lab, hired a leader and assembled an agile team to get started.
- **American Cancer Society:** For Ferro, securing innovation resources hinges on showing senior executives something concrete. "You need to give them confidence that this isn't some nebulous *thing*," he says. Another important element is focusing innovation around specific objectives. "When executives see you're targeting innovation at outcomes that matter and not aiming it blindly, they derive comfort from that," Ferro says.

Ferro dedicates a small percentage of the IT budget to experimenting with new ideas and spinning up proofs of concept. Before they are moved further in the process, ideas are subject to a more formal review. "Our process recognizes good ideas, so that even if we didn't plan it for 2013, for instance, we will pursue it if the ROI makes sense," Ferro says.

- **MasterCard:** Above all, says Lyons, having a CEO who understands the importance of innovation is critical. It also helps, he says, to show how the work done by MasterCard Labs enables other company efforts to succeed. Because Lyons reports to both the president of the technologies and operations division and the president of the global products and solutions division, "together, we can work through the really tough questions about why we should advance one idea or another," he says.
- **Grange:** Fergang agrees that the more you can show business leaders something concrete, the more they will back innovation. "When the business realized we were expending energy on innovation that could have been applied to known production needs, they asked, 'What are you doing?' Fergang says. "But when we started showing them our prototypes on a regular basis, that went away." The key, he says, is to gain the trust of business leaders by executing well on the basics. "You can't apply resources to innovation when you're not taking care of the rest of the business," he says.
- **Equinix:** The main thing, Lillie says, is to ensure innovation is focused on moving the business forward. "It's important to stay not only current with customers but, really, even ahead of them," he says. To fund innovations, Lillie takes an indirect approach, reserving a portion of his budget for innovation projects. "I don't formally say, 'This is our innovation budget,'" he says. "But in my budget [request], I always leave an earmark for innovation."

How do you involve external organizations?

- **CapitalOne:** Establishing a community with technology companies, academic institutions, startups, venture capitalists and collaboratives is essential to innovation, according to Shivanandan. CapitalOne works with MIT, Stanford University, Georgia Tech and the University of Virginia on research initiatives and is active in communities such as Fintech, an annual program run by the Partnership Fund for New York City and Accenture to encourage startups developing cutting-edge financial services technology products. The company also participates in hackathons and has sponsored some of these events in its lab.
- **Equinix:** After hearing a speaker discuss gamification at the Innovative CIO program at Stanford University (which Lillie helped develop), Lillie worked with Deloitte to revamp the company's sales processes using gaming principles and ideas. "We brought these ideas back from Stanford and drove them into the organization," he says. The sales system incorporates game elements such as leader boards, rewards and avatars and is being deployed across the globe, Lillie says.
- **American Cancer Society:** Ferro agrees that innovation is spurred by communicating with outsiders, which in his case include businesses like IBM and Johnson & Johnson. "We look at how we can learn from the industry standards and best practices in the private sector and apply that to our organization," he says. An example is a recent conversation he had with Terry Jones, founder of Travelocity, who emphasized the importance of being open to everyone and everything. "The trick is not getting overwhelmed by all the input, and that's where having established innovation processes comes in," Ferro says.
- **MasterCard:** According to Lyons, MasterCard Labs taps into a number of external sources to spark innovation and is currently opening up its services to others through open APIs.
- **Grange:** The innovation group occasionally shares prototypes with customers to get their input on the idea's value. Additionally, Fergang is involved with TechColumbus, a public/private partnership focused on central Ohio's innovation economy. The ideas shared by entrepreneurs and startups help him keep up with what people outside the insurance industry are thinking about. ◆

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How a small, fast SWAT team is improving performance at the Department of Veterans Affairs – one project at a time.

BY TRACY MAYOR

IT [TAKES ON] Bureaucracy

[redacted]

IN PERSON, IT'S HARD TO THINK OF DAVID PASCHANE AS SMALL — he's 6 feet 5 inches tall. But when you consider his position within the vast U.S. Department of Veterans Affairs (VA), it's clear he's playing the role of a little guy tackling a big, big bureaucracy.

Paschane, 44, is director of the Office of Strategic Services (OSS), a small, SWAT-like team within the VA's Office of Information & Technology (OI&T). The group consists of Paschane, two junior staffers and two contractors.

A performance engineer by training, Paschane's motivating vision is to transform heavy bureaucracies — where organizational structure controls the people — into what he calls "light enterprises," where structure is there to serve the people.

THINKSTOCK

If he was looking for heavy bureaucracy, Paschane came to the right place. The OI&T operation at the VA Central Office (VACO) in Washington, with an annual budget of $48 million, employs some 200 IT workers who provide tech support services to 10,000 customers, including 400 members of the Senior Executive Service. Nationwide, the VA employs about 327,000 people (not counting contractors), runs 152 hospitals, 821 outpatient clinics and 300 vet centers, and commands an annual budget of $187 billion. The IT budget alone was $3.1 billion in 2012.

To its critics, the department is bureaucracy at its worst. And indeed, the VA has come in for blistering criticism from all corners in recent weeks for a staggering backlog in the processing of benefits claims that has some veterans waiting as long as a year and a half for resolution. The problems are widely viewed as being partly political and partly regulatory, but also partly the responsibility of a top-heavy, slow-moving IT organization.

To Paschane, it's the perfect place to start asking the big questions. As he gives an impromptu tour through the maze of cubicles that make up the VACO IT operation, he asks, "How do people affect the performance of an organization? What is this thing called bureaucracy?" And, most pressing, "How do we learn to get better at what we do?"

Paschane has a Ph.D. from the University of Washington in Seattle, where he developed an organizational discipline — Performance Architectural Science Systems (PASS) — that aims to answer some of those questions.

PASS is built around the assumption that "unexamined, undisciplined work structures restrict employee growth and lead to inflexible, stagnant operations," says Paschane. On the flip side, he explains, light enterprises are able to respond dynamically to customer demands because their structure is adapted to fit their mission and goals.

Organizations move from A to B, from heavy to light, by tapping both information value and people value, Paschane says. In particular, he is interested in "collegial work" — that is, optimizing the value of people and information acting together to improve the performance of an organization.

At least, that's the theory.

In his nine-year tenure at the VA, Paschane has launched and overseen more than 25 engineering projects of varying scope and size that have all in one way or another produced a better fit between data and organizational structure, but they haven't brought about revolutionary organizational change — yet.

PROBLEM: HEAVY BUREAUCRACY

- Inflexible, stagnant operations
- Poor fit to mission and customer
- Systemic weaknesses
- Employee complacency
- Friction, fat, fear, fads and falsehoods

GOAL: LIGHT ENTERPRISE

- Structure fits mission and goals
- Ability to respond dynamically to customer demands
- Sustained growth in performance capability and capacity

KEY PLAYERS

- **Seasoned executive**
  » TASK: *Overcome inherited bureaucracy*
- **Chief of strategy**
  » TASK: *Fit capabilities to mission*
- **Operation managers**
  » TASK: *Sustain growth in employee capacity*
- **Potential leaders**
  » TASK: *Provide localized insight and engagement*

SOURCE: DAVID PASCHANE, PH.D., APLIN SCIENCE AND TECHNOLOGY
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Paschane landed in his current position in the Office of Information & Technology at the behest of Horace Blackman, CIO of National Capital Region IT at the VA (and a 2013 *Computerworld* Premier 100 IT Leader).

Blackman recalls that VACO IT had "17 different missions and 17 different customers" when he assumed his duties as head of a group that's in charge of servicing the VA's police department, administrative court system and the office of a cabinet-level secretary, among other customers. The IT group had been hampered by frequent reorganizations and relocations, high staff turnover that saw new hires replacing retiring experts, and undocumented procedures and poor communications that were unable to keep up with the agency's dynamic and expanding service offerings.

Blackman wasn't long at his new position, which he assumed in 2009, before he saw there was room for a performance engineer on his team, and Paschane moved over from a position in the VA's Office of Policy and Programs. The two created the OSS group in 2011.

As part of a three-year transformational effort by OI&T to revamp how IT services are delivered at VA headquarters, OSS staffers and IT volunteers formed multiple ad hoc Method Enhancement Teams (MET) to tackle specific problems. Teams of eight to 10 people brainstormed with subject-matter experts to create and implement action plans for redesigning areas critical to operational performance.

One result of their efforts: performance dashboards that give IT employees a visual representation of their effectiveness in solving help desk, Tier 1 and Tier 2 problems for customers.

MET teams have not only improved performance; they've also upped morale, says Blackman. "It's harder to measure, but from my perspective, the fact that we've engaged people in the change-management process, that we see their ideas coming to fruition, is a pretty significant accomplishment," he says. "You don't want to be reckless and jump on every idea that's proposed, but you have to be willing to listen. Innovation comes from the ground up."

As chief learning officer at the Veterans Health Administration (VHA), Jim Warner is charged with supporting continuing education requirements for the whole workforce, a not inconsiderable task: The VHA is the country's largest integrated healthcare system, with some 270,000 clinical professionals at more than 1,700 sites of care serving 8.3 million veterans per year.

Shortly after his arrival in August

2012, Warner found himself struggling to get his arms around the multitentacled systems that track continuing education. On one side, he needs to reduce costs by being better able to ensure that practitioners are getting approval only for courses they actually need and by making sure those courses are delivered in the most cost-effective ways.

On the other side, Warner wants to streamline the process by which the VHA interacts with the 13 different credentialing associations, such as the American College of Healthcare Executives, that grant medical and healthcare practitioner certifications, each of which has unique and constantly changing requirements.

"My question to [Paschane] was, 'How do I use my experts — my human capital — in a more efficient way?'" says Warner. "Through PASS, we are looking at the entire system end to end."

David Paschane

Paschane elaborates: "Essentially we are re-engineering the way VHA analyzes requests and approves conferences by subjecting data to more rigorous review," he says. "We're cleaning the data and making it fit the structure so the internal core operation is smarter and more effective."

The expected end result: The 450 analysts who serve the continuing education needs of the entire VHA organization will be able to more accurately assess continuing education requests, getting practitioners approval for the right training more quickly.

"What's really powerful about this is that we're freeing our human capital to focus more on the exceptions and less on the routine," says Warner. "We're able to put more resident expertise into the software, build more of the process into the [system], which allows us to increase capacity without a significant increase in cost or in human resources," he says.

As Deputy Assistant Secretary for Administration in the VA's Office of Administration (OA), Roy Hurndon's portfolio of responsibilities is vast. His customers are 10,000 VA staffers in the Washington area; the services he offers them include transportation, facilities management, health and wellness, environmental safety, media support, protocol requirements for cabinet-level employees, and more.

Hurndon has worked with the OSS on several projects aimed at using data in new ways to improve decision-making and reaction times within his organization.

In keeping the PASS discipline's commitment to monitor "emergent thinking" on performance from employees and customers, the OSS team designed and analyzed a rapid comment-card system and a more in-depth annual customer survey.

The digital comment cards, available via the VA's intranet, are engineered so administrative office staffers are notified immediately if there is a problem. For example, if a shuttle bus failed to show up at a scheduled stop, the comment-card system would make it easy to dispatch staffers to remedy the situation.

SIGNS OF SUCCESS

Innovation

Reduced costs

Increased capabilities

ICONS COURTESY OF MAGA DESIGN

"Most comment cards are drop-down windows where you select your problem from a list of issues," explains Suzanne Campbell, a program specialist with the OA. "David's team went one step further and added a section where employees can actually type in their specific concerns. This has been a big hit," she says. "VA employees have truly appreciated the personal side of this program, and I do too."

Analysis of data from the survey, which goes out to 5,000 employees once a year, can reveal longer-term adjustments that make sense for the organization. For example, Hurndon says his office recently adjusted the makeup of the fleet of vehicles used to transport senior leaders within the national capital region after survey results suggested that shuttle buses would, in some cases, be more rapid, flexible and efficient than individual cars.

In the area of facilities management, Hurndon's organization teamed with the U.S. General Services Administration to install meters to monitor water and energy usage building by building. Paschane's OSS group filled the gaps with an application that presents the data from those meters in a way that lets service directors take specific actions — or urge employees to do so — to reduce costs related to heating and cooling, lighting and energy consumed by IT systems and other equipment.

"David's group is effective at distilling data into usable bits that help us with actionable decision-making," Hurndon says of the project, which has the potential to save $3.5 million over 10 years.

To address the ongoing and rising costs of space management, Paschane and his team are in the process of developing a tenant use optimization scorecard for Hurndon's group that will give executives a snapshot of how their policy and management decisions — including leasing vs. owning, where to house contractors, and the extent of any telecommuting policies — compare against 170 mixed-use federal facilities in the Washington area. "There are no easy sensors for collecting that data," Paschane explains. "Up until now, it's been scanned from paper or self-reported."

As successful as the OSS projects for OI&T, VHA, OA and other departments have been, it's unclear if they will generate enough momentum to achieve the overarching vision of Paschane's PASS discipline — to "change the nature of work" inside a vast organization not known for agility.

"If you look at the performance statistics of the VA, whatever they're doing is not working," says Chris McGoff, founder and CEO of The Clearing, a Washington consultancy that specializes in change management. "What I like about [Paschane's] work is his focus on both collective and individual change, the local tribal change and the overall leadership change."

It's the latter that's likely to prove most challenging, McGoff warns. "David has a lot of passion, but as we know, 90% of corporate change-management projects fail," he points out. "The question becomes, can the VA afford to shrink from this challenge? Will they find the moral conviction to beat those odds?"

"We're trying to take down bureaucracy bit by bit, but yes, there has to be a desire among top leadership for that to happen," acknowledges Paschane. "If we get support and commitment from the top, we can get in there and start working." ◆

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Big DATA, Big IMPACT

[redacted]

Four of this year's **Computerworld Honors Laureates** *use big data to battle the effects of unemployment and climate change, raise social awareness and help at-risk students.* **BY JULIA KING**

UNITED NATIONS researchers had a sobering realization in 2010. For all of the official data and reports collected by the group's member nations and various UN programs and agencies, precious little of the data that supports the organization's operations was truly up to date.

That left officials worldwide trying to respond to socio-economic crises, such as the financial meltdown and staggering unemployment, with data that was months and sometimes years old.

In response, the UN launched an initiative called Global Pulse to coordinate research on big data for development. For its efforts, the UN was recognized as a 2013 *Computerworld* Honors Laureate.

Global Pulse "came out of the very pointed recognition that there's a need for real-time information, especially in an age of hyperconnectivity when something that happens one place in the world can immediately impact somewhere else," says Anoush Tatevossian, a UN strategic communications officer and partnership manager.

The UN isn't the only organization working to harness the power of big data and analytics for social good. Several other 2013 *Computerworld* Honors Laureates gather and analyze information to do things like minimize the impact of climate change, identify at-risk students and improve financial services to underserved populations.

Celebrating its 25th year, the *Computerworld* Honors program recognizes organizations that create and use IT systems to promote and advance public welfare. On June 3, this year's 267 honorees will gather in Washington to celebrate their achievements. Here's a look at projects undertaken by four laureates.

Monitoring Mood Shifts

One of the first projects United Nations Global Pulse took up was analyzing social media chatter and sentiment to identify trends related to unemployment increases, and then inform policymakers of likely effects. Analyzing 500,000 blogs, forums and news sites, the team used text mining and social media analytics tools from SAS to examine two years of social media data from the U.S. and Ireland. They scanned for all references to unemployment and coping mechanisms. The team then compared and analyzed so-called mood scores, which were based on the tone and themes of various references to unemployment.

In the U.S., a rise in "hostile" or "depressed" mood scores occurred four months before the unemployment spike. Increases in "anxious" chatter in Ireland correlated with a spike five months later. Increased "confused" chatter preceded a spike by three months, while "confident" chatter decreased significantly two months out. A dashboard displayed trends such as mood change over time, and leading and lagging indicators of unemployment shocks.

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Travis Koberg says CSC hopes to use big data and analytics to help companies deal with climate-related issues.

Another analysis revealed that increased chatter about cutting back on groceries, increasing use of public transportation and downgrading one's automobile could predict an unemployment spike. After a spike, surges in conversations about canceled vacations, reduced healthcare spending, and foreclosures or evictions shed light on lagging economic effects. This kind of information is invaluable for policymakers trying to mitigate the negative effects of increased unemployment, Tatevossian says.

Global Pulse is set up as an innovation lab at the UN in New York and is highly dependent on partners like SAS. "We're really a space to learn how big data and some of the new analytic technologies could be useful to the UN system," she says.

"We're very interested in reaching out to the private sector because we're interested in taking what has been tried [there] and seeing how it can be applied to UN processes," says Tatevossian. For example, she compares Global Pulse's work on unemployment to work that consumer goods companies do on a daily basis. "All we did is re-jig [the tools] that are used for brand monitoring and we treated unemployment as a brand," she says.

The UN has opened an additional Global Pulse lab in Jakarta, Indonesia, and will soon open a third in Kampala, Uganda.

Taking the Planet's Pulse

Every minute of every day, hundreds of thousands of sensors collect a huge volume of climate-related data for use by scientists working on very specific research projects at government organizations such as the National Oceanic and Atmospheric Administration (NOAA) and NASA.

"What we figured is that there must be a way to leverage this data in a wider way, to help companies with some of the climate-related issues they're grappling with," says Travis Koberg, head of Computer Science Corp.'s Big Data and Analytics Group, a 2013 *Computerworld* Honors Laureate.

Enter ClimatEdge, a suite of risk management tools that applies big data analytics to historical data from NASA, NOAA and other public sources. By exploiting this previously underutilized climate data resource, ClimatEdge provides new insights to commercial and public interests that need to minimize risk and make better-informed decisions, says Koberg.

Electronics manufacturers, for example, might want to find alternatives to East Asian semiconductor supplies if Pacific storms fueled by warming ocean waters become more intense. Or homebuilders might want to prepare for fluctuations in lumber prices brought on by climate conditions that force pine beetles and other pests that prey on trees to expand their range and destroy more forests.

Most of the data CSC is collecting is structured. What distinguishes ClimatEdge as a big data project is the sheer volume of data being collected and analyzed, says Koberg. "The volume is on an order of magnitude scale that you can't do a lot with in Excel, which is what a lot of scientists use," he says.

ClimatEdge began producing reports in June 2012. It is updated on a continuing basis as CSC learns new ways to apply evolving data science principles and gains access to new data sources.

Looking ahead, Koberg says he expects CSC to tap into, combine and analyze other underused big data reservoirs. "Climate is just one area of data. Healthcare is another. We work with healthcare where we collect data across a health system and put it together with climate data to hypothesize about characteristics tied to a certain disease," he explains. "Over time, we're looking at all sorts of data in various domains."

Creating a Student Safety Net

An educated workforce is absolutely critical to competing successfully in the global economy. Yet the U.S. ranks lower than 10th among countries in education attainment. Only about 35% of students who begin a four-year college degree program complete their education where they began their studies. Moreover, over the course of the past 20 to 30 years, retention and completion rates have steadily dropped at a time when global economic competition has increased exponentially.

"I'd personally position the problem as a national crisis," says Josh Baron, senior academic technology officer at

Marist College in Poughkeepsie, N.Y.

The Open Academic Analytics Initiative, an Educause project funded by the Bill and Melinda Gates Foundation and a 2013 *Computerworld* Honors Laureate, aims to significantly reduce education interruption and dropout rates by identifying at-risk students via predictive analytics and then proactively intervening to support these students before they leave school.

Launched in May 2011, the OAAI collects data and log information from member schools' learning management systems and couples it with student aptitude and demographic data. A predictive model, built entirely in open source, is then applied to this data to identify at-risk students.

To build the model, researchers analyzed several semesters of data from Marist College students. Next, the team used BI systems, primarily Pentaho open-source software, to put the analytics systems together.

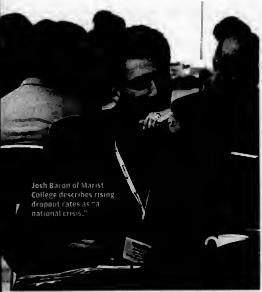
"We thought it important to have an open-source solution to reduce costs of ownership so that other institutions could adopt it," Baron explains. "The other big advantage of open source is everything becomes transparent and open to other institutions, especially the predictive model, which we've released to other institutions."

The OAAI team applied its model to 2,200 students over a period of two semesters, identifying those who might benefit from interventions, such as messages from instructors that express concern for a student's performance and/or additional online academic support.

In the end, the OAAI team determined that such interventions had a significantly positive effect, resulting in a 7% higher final course grade for students who received them.

"We far exceeded our expectations in terms of impact of the project," Baron says. "We weren't necessarily expecting to see statistically significant outcomes, so this has given us great encouragement."

Going forward, Baron says OAAI is seeking additional funding to continue the program, which is focused on low-income students who often drop out of school for economic reasons.



Josh Baron of Marist College describes rising dropout rates as "a national crisis."

Bringing Social Issues to Light

Socially sensitive issues such as domestic violence, foeticide and child sexual abuse are taboo as topics of discussion in much of India. But these are precisely the issues that Bollywood actor and filmmaker Aamir Khan took on as topics of his TV show *Satyamev Jayate*, which translates to *Truth Alone Prevails*. The show's goal was to prompt discussion about these rarely talked about societal problems and to learn more about how Indian people thought and felt about them. It would be a first step toward resolving them.

To achieve this goal, Persistent Systems Ltd., a 2013 *Computerworld* Honors Laureate, set about monitoring and analyzing a massive amount of data it collected from social media channels immediately after each 90-minute episode of the program aired.

"The show is a cross between *Oprah* and *60 Minutes*," explains Mukund Deshpande, head of BI/analytics at Persistent Systems. "The goal was to use social media to connect directly with people and close the loop as a way to have a conversation with viewers."

The show was carried on 13 TV channels in India, and each episode was posted to YouTube within 30 minutes of its airing. Each show immediately elicited millions of messages on Facebook, Twitter and other online discussion forums. The challenge, says Deshpande, was to make sense of long, complex messages that were very emotional and often contained stories of people's personal encounters with abuse.

This created a big-data problem both in terms of volume and network performance. The show was flooded with a staggering 1.09 billion impressions across social channels. All structured and unstructured data was analyzed in real time to convey the show's impact on legislation, society and individuals, which was displayed on a so-called impact dashboard.

Persistent Systems designed and developed the custom end-to-end analytics process in three weeks. The project was implemented using the latest distributed computing technology and Hadoop.

Adding to the unstructured data challenge, social media responses were in "Hinglish" (Hindi words in Roman script embedded in English). This ruled out using existing tools to handle messages, which is why developers created a customized system to understand response sentiment.

Deep analytics extracted valuable insights, Deshpande says. The new system aggregated all unstructured data then automatically filtered it to weed out spam and unrelated messages. Valid messages were tagged and rated. Short messages praising the show were rated lower than longer messages and personal stories. Final selection was done manually using triangulation to determine the top content.

Deshpande says that social scientists have expressed interest in using a similar process to conduct a new kind of social research. "Usually, they form a small group of people and study them intensely for three to six months," he notes. "But what we have here is exactly the opposite of that. We don't have rich data about a small number of individuals but data about millions of people, including their age and gender and how they feel about particular issues. It would be a new way to do social science research." ●

Security Manager's Journal

MATHIAS THURMAN [illegible]

Scrutinizing an Acquisition

It's best when you can do a security review ahead of the due diligence, but one will be essential at some point.

MAYBE I'M AN ODDBALL, but I like the action that surrounds a merger or acquisition. I guess I need a little unplanned activity every now and then to distract me from my day-to-day tasks. Whatever the reason, I was excited to hear that my company would be acquiring a small company. It had been years since we had done anything like that.

I just wish I had been informed earlier. When security isn't properly represented during the initial due diligence phase of a merger or acquisition, problems can go undiscovered. For example, during our last acquisition, we uncovered numerous application security problems. User credentials weren't encrypted, and applications had multiple SQL injection vulnerabilities that could be exploited to obtain the unencrypted passwords. But for that deal, the security team was involved early enough to take part in due diligence, so we were able to discuss the cost of remedying those problems during the negotiations.

computerworld.com/blogs/security

Despite it being too late this time to affect the negotiations, my team still needed to conduct a complete assessment of the acquired company's security measures before allowing any network integration. The new company seemed to have done a good job with endpoint protection: An assessment of its PCs and servers disclosed up-to-date patches, antivirus software and server hardening. It also had robust firewall rules and solid intrusion detection.

Not everything was ideal, though. One problem concerned the processing of credit cards.

My company has made a point of not directly handling such transactions, so that we aren't compelled to comply with the stringent Payment Card Industry (PCI) security standards. By using third parties to process payments, we only expose the data entry frames within our website, and because we don't process or store any details regarding the payment information, we don't have to be PCI-compliant. But our new acquisition does process credit card transactions, and it stores the credit card data and payment information in its database. That means that it must be PCI-compliant, so "Yay!" to that, but we aren't, and we have no desire to go down that road. But we can't very well connect that PCI-compliant environment to our noncompliant environment without undermining the acquired company's PCI certification. What we're going to do is migrate the new company to our credit card processing standard, thereby avoiding the PCI requirements. That will take time, though, and it will slow down integration.

> **When security isn't represented during due diligence, problems can go undiscovered.**

Trouble Ticket

SaaS and Cloud Concerns

A couple of other issues will simply take some time to evaluate. One is that the company runs virtually all of its major corporate applications as software as a service, and it uses cloud-based file storage for sensitive data. SaaS and the cloud aren't problems in themselves; we use both ourselves. But we evaluate all of our cloud vendors so that we fully understand their security posture and the nature of the integration between us and them.

Finally, there's the consideration that the acquired company uses more than 30 partners around the world for things like software development, help desk and other corporate functions. That's a significant number for a company with just 40 or so employees. The thing about all those partnerships is that we have a very stringent review process for taking on partners, especially those who work in countries that are considered risky. We're going to need to review all existing contract agreements, nondisclosure agreements and the like to ensure that they meet our standards. ◆

This week's journal is written by a real security manager, **"Mathias Thurman,"** *whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com.*

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OPINION

LYNNE Y. WILLIAMS

Keeping Infosec a Step Ahead of the Bad Guys

We have to think like hackers and develop a risk-based approach to security.

INFORMATION SECURITY professionals have a tough time of it. Consider what they have to cope with in today's IT environment. You have big data meeting BYOD, a combination that almost invites cyber espionage. The traditional method for protecting corporate networks was to create a hardened outer shell that restricted access to internal data — the so-called M&M network that's hard on the outside but soft in the middle. That external shell is tough to crack, but attackers have found creative ways to get to the soft middle by using lost or stolen devices or employing social networks to glean usernames and passwords.

Meanwhile, attacks on individual and corporate digital assets are on the rise, and the black hats get more ingenious every day. Infosec professionals have to stay one step ahead, and that requires that they be well educated and as thoroughly trained in the dark art of circumventing network security as the bad guys. Going forward, IT security gurus will need to think analytically — understanding not just how to set up security, but also how to craft security solutions so that the business focus is supported while at the same time protecting the business's digital assets.

Focused procedures, such as penetration testing and "ethical" hacking, can be effective at smoking out specific vulnerabilities, but a holistic approach to network security that blankets the perimeter and protects against a broad range of attacks is better able to adapt to the constant evolution of assaults of this type.

To train for this type of holistic approach, students taking infosec courses must practice a variety of defensive techniques, such as configuring access control and designing comprehensive security policies. They must also learn how to properly conduct an organizational security audit to identify security breaches and other problems.

Too often, college courses that prepare and train cybersecurity professionals are specialized and not part of the core curriculum. Moreover, they often remain stuck on rigid, traditional security approaches that lack the flexibility needed in a mobile world. A new approach is needed, one that blends a focus on technology and security techniques with social psychology, risk management, collaboration and overall curriculum integration. An effective educational program would recognize the need for security that's flexible and would include such flexible security education throughout the curriculum, from entry-level to advanced, and in all classes, whether they are focused on some aspect of technology or on developing leadership skills.

Similarly, an effective curriculum is one that helps students think like professional hackers while guiding them to develop a risk-based approach to security — which ensures that appropriate measures are applied to protect key data. The National Security Agency is promoting this new approach to cybersecurity education with its hacking competitions, a hands-on way to showcase potential threats and countermeasures. For their part, universities are moving toward hands-on virtual labs and introducing areas ranging from ethics to social psychology.

Just as vital, though, is the need for cybersecurity education for all students, and not just those studying information technologies. In the end, every user has a role in creating a dynamic mobile environment that offers flexibility while remaining secure. ◆

Lynne Y. Williams is a faculty member in the MSIT program at Kaplan University who has been working with computers and networks since the days of VAX minimainframes. The views expressed in this column are solely hers.

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Career Watch

ASK A PREMIER 100 IT LEADER

Gary Hensley

The director of IT at Clif Bar and Co. answers questions about the **value of certifications** *and transitioning to the security field.*

Are certifications worthwhile? Which ones are most valuable for someone just embarking on a career in IT? Yes, certifications can be very worthwhile. When recruiting for IT talent 10 years ago, I weighted a four-year degree much heavier than certifications, but times have changed. Although a business degree is an excellent foundation for IT business analysts, technical certifications can provide a solid foundation for network, systems and help desk positions. For those just embarking on an IT career, priority should be given to the most common mainstream technologies. Microsoft has several entry-level MTA (Microsoft Technology Associate) certifications focusing on server, networking, security and desktop operating systems. For networking professionals, CCNA (Cisco Certified Network Associate) continues its long standing as a solid credential. Server virtualization is a hot topic, and VMware offers VCP (VMware Certified Professional) for people who implement and maintain VMware-powered virtual environments.

askaleader@computerworld.com,

After doing desktop support for five years, I am ready for a change and am considering the security field. What would help me make this transition? If your desire is to grow into the security field in your current company, it might make sense to discuss your development goals with your manager and possibly the manager in charge of systems security. Mentoring under your own security professionals is probably the most pragmatic approach to transitioning into a new role. Hopefully, your company encourages career broadening within IT. In addition, pursuing certification may be worthwhile. A respected advanced credential for IT security professionals is CISSP (Certified Information Systems Security Professional), but this may be out of scale for those entering this profession for the first time. There are many other security certifications offered through security vendors, associations and universities that may be worth a look to prepare for the transition.

Going Beyond LinkedIn for Jobs

ISTOCKPHOTO

Too many job seekers think LinkedIn is the only social media tool that can lead to a new job, says Susan Vitale, chief marketing officer at iCIMS, a talent acquisition technology company. In a recent *CIO* magazine article, she suggested five ways you can hunt for jobs on both popular and lesser-known social networks.

1 **'Like' Companies on Facebook**
When new positions become available, many companies post them on their Facebook pages. "Anyone who follows that brand on Facebook will be the first to know if something opens up," Vitale says.

2 **SEO Your Facebook Profile**
Facebook's new search tool, Graph, makes it easier for others to find public information about you, and that could be a good thing if you're in the market for a new job.

3 **Search Hashtags on Twitter**
"Progressive companies will often post open jobs on Twitter with appropriate hashtags that are easy to search," Vitale says. And those job listings are posted in real time.

4 **Be Active on Quora and Squidoo**
Being active on question-and-answer site Quora and community interest page Squidoo is "a great way to brand yourself as a subject expert, showcase your talent and show off your interests," Vitale says.

5 **Don't Neglect Google+**
Ignoring Google's social network is a mistake, since the site is tightly integrated with the popular search engine. "Because Google ranks Google+ profile pages high," says Vitale, "it's important to fill out yours with updated information and optimize it for your job hunt."

— KRISTIN BURNHAM

BUT LINKEDIN STILL MEANS BUSINESS

LinkedIn seems to be used by far more recruiters than other platforms.

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#1615.5009 C++; multi-thread; oo dvlpmnt, parallel & distrib computing; large scale distrib syst: data process, databases & SQL & stats or mach learn

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#1615.5454, oo sw dvlpmnt, databases & SQL dvlpmnt; large-scale data process & info extract, parallel & distrib computing; perf analysis of large scala distrib syst, C++, Java, &/or C#, & Media pipelines

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SHARKTANK

TRUE TALES OF IT LIFE AS TOLD TO SHARKY

HAL MAYFORTH

Hey, It's Her Choice

Pilot fish becomes IT director of a midsize city, and early on he has a chat with an IT manager with a problem: Staffers from the business office were constantly coming to the data center to use a computer that they claimed they didn't have room for in their area. He's been trying for over a year to get it out of the data center, but always runs up against that objection. Do you want me to get it moved? fish asks. Sure, says the IT manager. "Just then," fish reports, "a manager from the business office entered the data center to work on the system. I went up and told her, 'We're going to have to move this computer to the business office. Would Wednesday be fine, or would you prefer Thursday?' She responded, 'Thursday.' The IT manager stared at me in disbelief and asked how I was able to accomplish this. I told him the art of being a manager involved giving people options so they felt empowered, but ensuring that the end result was what was desired. He shook his head and left the room."

Right Tool, Wrong Problem

Pricey new consultant complains bitterly about the performance of a source-code management tool this pilot fish is responsible for, and fish soon hears from his director. "If the tool cannot meet my expectations for speed, maybe we have the wrong tool," director informs fish. Fish says he suspects that limited Wi-Fi bandwidth is the culprit, and he'd appreciate being called next time the software has the problem. Very soon, fish gets the call to come to a conference room. It's standing-room-only – in fact, as many people are standing as sitting – and they're all trying to access the wireless network at the same time. "I took some screenshots of the network status screen showing terrible wireless throughput and sent them to the director," fish says. "While I was at it, I documented several other things that had nothing to do with the tool that we could fix to speed up the tool's performance. Did anything on the list get fixed? No. But the speed complaints have stopped."

Wheel, Reinvented

Excel power user flags down this passing pilot fish to help with her PC. "She was trying to copy out information from this spreadsheet someone had sent her," says fish. "When she pressed Ctrl+C, the spreadsheet flickered a few times, and all the data vanished. I replicated it a few times, and then my confused expression turned into an eye roll. I checked the list of macros in the workbook and, sure enough, in very professional documented VB script, was a macro that cleared a worksheet – assigned to Ctrl+C. Whoever created that spreadsheet must've thought they had invented the idea of keyboard shortcuts."

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OPINION

THORNTON A. MAY

IT Cost Management ≠ Cost Reduction

CEOs don't want to spend less on IT; they want to spend smarter on IT.

I RECENTLY MISINTERPRETED some CEO cost-speak. The enormous gap between what I thought I was hearing and what the CEOs were actually saying is tremendously illustrative and well worth looking at.

I was involved, albeit tangentially, in a dozen executive searches for new CIOs. All of these searches were being led by CEOs of global, brand-name, Fortune 300 companies. In fact, nine of the companies were in the Fortune 100. In my experience, such leaders are enlightened and appreciative of the value of IT.

That's why I was surprised — shocked, actually — to find that every one of these CEOs ranked IT cost management among the top three capabilities they were looking for in their next CIO. I couldn't understand it. How could that be when just about everything one reads in the business press and from subscription research firms claims that growth is the primary focus for top companies' leaders? What was going on?

Could it be that, against astounding odds, I had stumbled into a thicket of Luddites masquerading as modern leaders? No; the job requirements crafted by these CEOs were not outliers. I talked to three of the CIO communities I manage and learned that IT cost management is at or near the top of most CEOs' expectations of their CIOs.

But the way that I was reading "IT cost management" is far removed from how the CEOs were thinking about that concept. I was afraid that new CIOs were going to be hired on the expectation that they would be frenzied, anti-technology, chainsaw-wielding cost-cutters. All of the visions I have ever had of CIOs using technology to help their companies move in new and profitable directions were going up in smoke.

But no. Nothing could be further from the truth. In reality, the CEOs were looking for someone who deeply understood IT cost drivers and the relationship between optimized IT infrastructure and innovation. In other words, the kind of cost management these CEOs had in mind involved the CIO managing an updated and future-looking IT platform as a possible source of funding for new initiatives.

Quite simply, I had equated cost management with cost reduction. But CEOs don't want to spend less on IT; they want to spend smarter on IT. CEOs see new technology as a way to lower costs and increase competitiveness. They have come to realize that IT is the new basis of competition and that without an up-to-date technology platform, they can't compete. They are, it would seem, channeling Andrew Carnegie.

Carnegie, the great steel magnate of the 19th century, believed in investing aggressively in the latest technology, as business historian H.W. Brands relates in *The Reckless Decade: America in the 1890s*. Carnegie repeatedly ripped out incumbent technology in a ruthless pursuit of lower costs. He believed that every month his company used outdated equipment was a month forever lost to inefficiency. Upon hearing how British steelmakers prided themselves on wringing the last ton of steel out of dated equipment, he scoffed: "That is what is the matter with the British steel trade. Most British equipment is in use twenty years after it should have been scrapped."

Carnegie was right. During the 1880s, costs were halved, output doubled and profits rose.

What are you waiting for? Get out there and re-platform something. ◆

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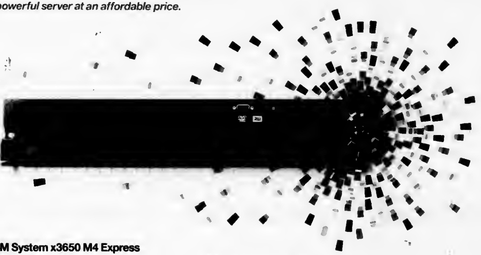

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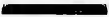

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[2] Results achieved by comparing recommended system to IBM System x3650 (with Xeon® E5205) using IBM Systems Consolidation Evaluation Tool (https://roianalyst.alinean.com/stg/). The comparison is between IBM System x3650 M4 and x3650 (does not include x3650 M2 or x3650 M3).

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